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January 26, 1952

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE

Koala Starlet

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MEDICINE

Polio Prevention Closer

Finding that there are only three different kinds of polio virus brings medical scientists closer to prevention of infantile paralysis.

➤ BECAUSE SCIENTISTS at four different universities have discovered that there are only three different kinds of polio virus, medical science is closer than ever before toward the prevention of infantile paralysis.

The next step in the fight to prevent polio is incorporation of the three viruses into a vaccine which can be used safely and effectively in man.

Investigations at the University of Southern California, University of Utah, University of Kansas and the University of Pittsburgh were conducted with the support of the National Foundation for Infantile Paralysis and coordinated by Dr. Hart E. Van Riper, medical director of the Foundation.

Dr. Van Riper and Dr. Jonas E. Salk, of the University of Pittsburgh, department of bacteriology, speaking as guests of Watson Davis on Adventures in Science Program over the Columbia Broadcasting System radio network, told how viruses isolated from more than 100 sources show that there exist only three different viruses of polio.

Polio virus was first discovered in 1909; not a great deal of work was done with this virus over the next 20 years and it was not until 1930 that research workers became suspicious that more than one polio virus existed. This was suspected through laboratory experiments in which it was found possible to infect an animal with virus #2 even though the animal had been protected against virus #1. In 1948 a third virus turned up which was different from #1 and #2. The existence of more than one virus explains why polio may strike more than once. The ultimate goal is to devise an effective vaccine for the prevention of polio, and to incorporate in such a vaccine all of the viruses that can cause the disease for which it is desired to produce immunity.

The customary way in which vaccines act is through the development in the body of the injected person of substances that neutralize the virus. In this way the establishment of infection is prevented if after vaccination the individual comes into contact with the particular viruses that are included in the vaccine. If poliomyelitis is caused by one, two, three or more viruses, it would be necessary to include all of them in the vaccine in order to protect against all of the polio-producing viruses.

The magnitude of the operation necessary to find how many different types of poliomyelitis virus exist is great. After studying viruses isolated from more than 100 sources, the evidence points very strongly to the existence of but three different viruses. The next step is the incorporation of these three viruses into a vaccine that can be used safely and effectively in man. All this means that scientists are closer than ever before to the final goal.

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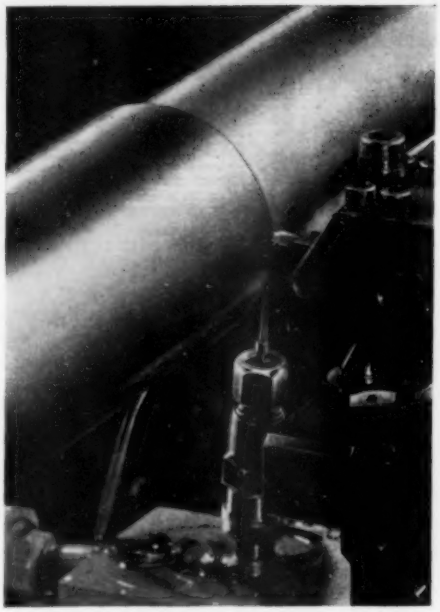

EFFICIENT METAL-CUTTING—The Hi-Jet method of metal cutting directs an oil stream at the contact edge of the cutting tool, thus increasing the efficiency of metal-cutting.

GENERAL SCIENCE

Seven Seek Each Science Foundation Fellowship

➤ MORE THAN 2,700 students from every state and territory in the Union have applied for the approximately 400 fellowships worth $1,350,000 to be granted by the National Science Foundation.

This ratio of one fellowship to seven applicants compares, in the experience of administrators of fellowships, with a usual rate of one to three. A preliminary examination of the applications shows that practically none of the fellowships will go to anyone who has not achieved straight A grades throughout his college career.

The granting of the fellowships is being administered by the National Research Council, which has handled many governmental and private fellowship funds.

The majority of applicants, according to Dr. Claude J. Lapp, head of the fellowship office for the NRC, wish to study in the fields of biology, chemistry and physics. Ranking just behind these are engineering and geology. Other applications cover the entire range of natural sciences.

Dr. Lapp stated that from a look at the applications it appears as though the American taxpayers are going to spend their money on a group of "Class A humdingers." The money, he believed, would be returned to the country, as a result of the increased training of these students, manyfold.

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TECHNOLOGY

Interconnecting Pipelines

➤ A SEMI-NATIONAL "hook-up" of pipelines bringing natural gas from fields in the southwest to northern and eastern areas was suggested in Philadelphia by Frederic O. Hess, a director of the Gas Appliance Manufacturers Association.

Interconnecting pipelines between the now separated main lines would be a public aid, particularly when seasonal or other emergency conditions place extra stress on the system, he indicated.

"We know how effectively such interconnecting and looping systems protect the electric industry against power failure, peak demands, unbalanced load factors and excessive distribution costs," he stated. Similar benefits would result if the many natural gas pipelines supplying gas to the area from the Mississippi to the Atlantic coast were interconnected. He indicated particularly the benefits that would follow an interconnection from Kansas City eastward to New England. This would make Texas panhandle gas available in times of need to the eastern area.

Another step advocated by Mr. Hess to assure the eastern states of a plentiful supply of natural gas during the winter months is a search for additional natural gas in the Appalachian region. It was gas from this eastern area that was first used in America for heating and lighting.

A research and development program sponsored by the gas industry is also recommended by Mr. Hess. The program would be concerned with the integration of the distribution facilities and expansion of service to the public. The U. S. has some 260,000 miles of natural gas pipelines.

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ENGINEERING

Jet Oiling for Metal Cutting

Method for quintupling metal machining production developed. Fine jet of oil under high pressure squirted upon cutting point to give lubrication.

➤ A NEW way of jet oiling metal cutting that can quintuple metal machining production to speed defense and industry has been invented by R. J. S. Pigott, director of engineering research of the Gulf Research and Development Co. in Pittsburgh.

Faster cutting of difficult metals, more economical cutting of softer metals and cutting of the new metal, titanium, at any reasonable speed are all forecast by the new machining process announced by the Gulf Oil Corporation.

Squirting a fine jet of a specially-developed cutting oil under 400 pounds per square inch pressure from below and directly upon the cutting point, the new method lubricates as it cuts. This allows the machinist to cut faster at the same time that the oil cools the metal and lengthens the life of the cutting tool.

The new process, marketed under the name Hi-Jet, will be developed by Thompson Products, Inc., of Cleveland, Ohio. They will devise ways of applying the new process to hard, tough steels and alloys, with a saving of time, power and scarce materials.

Wonder that direct lubrication of the cutting point in metal working had not been applied 50 years ago was expressed by Mr. Pigott. He is a mechanical engineer, a graduate of Columbia University and president this year of the American Society of Mechanical Engineers. Older processes used in cutting metals flood the piece of metal being cut with so-called cutting oil, according to Mr. Pigott, but the oil is deflected by the metal chip being pushed up by the tool as it cuts. The cut surface comes out dry, and the only effect of the oil is to carry away some of the heat developed by the friction of the tool.

In the Hi-Jet process, by installing a compression pump and from one to five jets under the cutting point on the machine, Mr. Pigott explains, lubrication reaches the exact point where this friction develops the heat. This allows faster cutting, longer wear for the machine tools, and the possibility of cutting metals too tough for present practice. Additional cooling is provided in the design of the new apparatus by a thin curtain of the same oil dropped from above the tool, so that all cuts are made within a small volume of space surrounded by cooling oil. Hi-Jet oil can also be used on the same machine for lubrication and for a hydraulic fluid for moving parts, which allows re-use of the oil and fewer kinds of oil to be stocked by the shop.

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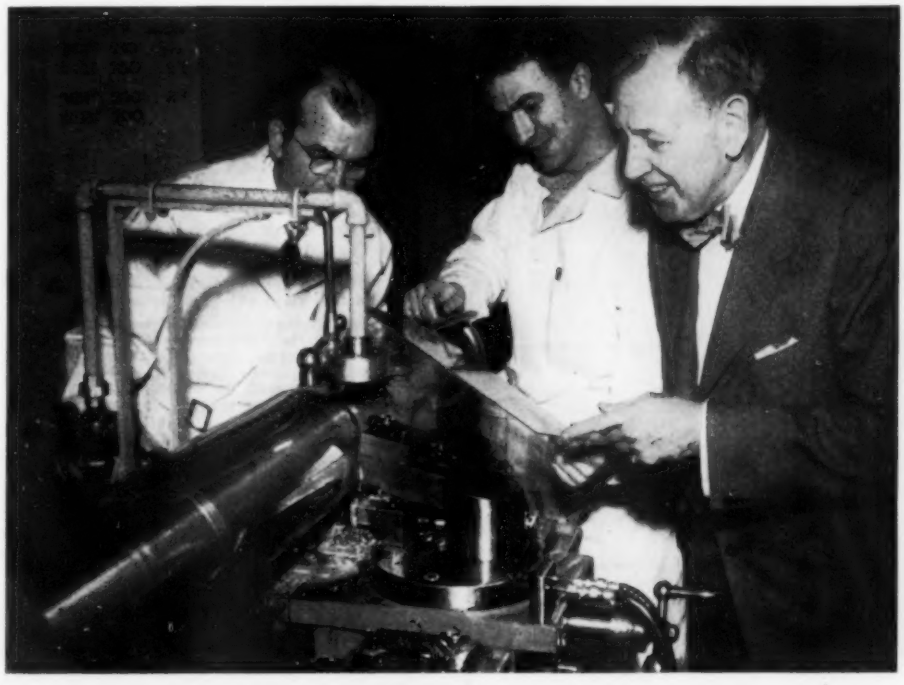

JET OILING—Paul Busang, engineer, George Wright, machinist, and R. J. S. Pigott, inventor of the new Hi-Jet method of faster machine cutting for hard metals (left to right), are shown here discussing this process which can quintuple metal machining production.

MEDICINE

Florida Rats Help Fight Disease in Britain

➤ A DOZEN swamp rice rats have been imported from Florida by a British veterinary scientist to help fight disease.

The scientist is Dr. J. S. Steward of the Imperial Chemical Industries Ltd., London. He believes that the rice rat should be ideal for testing the effectiveness of new drugs because they are considerably smaller than cotton rats and white rats now used for this purpose. He also recommends testing the rice rat for its susceptibility to infections which do not normally take well in other laboratory animals.

Dr. Steward has been able to keep and breed the imported rice rats in his laboratory in England on a diet of ordinary rat cubes supplemented with carrots.

He found the rice rat far from a docile animal by nature, as it will bite even before being handled. He thinks, however, that after several generations in captivity it may settle down to more gentle ways, as the cotton rat has done.

Dr. Steward's methods for successfully rearing rice rats as laboratory animals are reported to fellow scientists in the JOURNAL OF HYGIENE.

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GEOPHYSICS

Thunderstorms Intensify Earth's Electric Field

➤ THUNDERSTORMS as far as 100 miles away have been found to produce strong disturbances in the intensity measurements of the earth's electric field.

Two possible explanations are: 1. Such disturbances are caused by wind-blown electric space charges. 2. They are caused by a layer of increased conductivity about 12 miles above the earth's surface.

Dr. G. F. Schilling of the Institute of Geophysics at the University of California at Los Angeles, finds, through research in both his native Austria and in the United States, that thunderstorms act as generators which reverse the normal pattern of electrical currents flowing in the atmosphere. They are thus a principal factor in maintaining the earth's electric charge.

Dr. Schilling's experiments verify the importance of distant thunderstorm activity on the electric field of the earth.

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GENERAL SCIENCE

First Annual NSF Report

➤ THE MOST immediate problem facing the National Science Foundation is the relation of the present emergency to the support of basic research. This is pointed out in the first annual report of the foundation transmitted by President Truman to Congress.

The problem is one that has been considered at length by the board of the foundation and its director, Dr. Alan T. Waterman, the report says. Declaring that the country must be in a state of operational readiness, insofar as science is concerned, for the next two or three years, the report goes on to say that, over the long pull, the program of basic research of the foundation can be most effective.

Figures show, the report states, that the smallest portion of financial support for all scientific work goes to basic research. However, no up-to-date assessment has been made of the national research and development picture. The foundation considers that one of its first tasks will be to make a thorough review of the present national pattern of research and development.

As for scientific manpower, the report points to the growing shortage in both research and development. The extent to which the defense program will continue to drain the national supply of scientific manpower, the report says, emphasizes the need for the training program in science planned by the foundation.

Dr. James B. Conant, chairman of the National Science Board, in a foreward, emphasizes that the report must necessarily be a description of progress in formulating plans.

"If the Congress will each year provide sufficient funds to enable the director and his staff to carry out the program we have laid down," declared Dr. Conant, "I have no doubt that over the years this new way of expending taxpayers' money will prove to have been a wise departure from the usual pattern."

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METALLURGY

Alloy Titanium and Zirconium for Wide Use

➤ TWO PLENTIFUL but now little used metals, titanium and zirconium, will mix in any proportion to form valuable alloys, the U. S. Bureau of Mines has discovered in recent investigations.

These light, corrosion-resistant metals can be used in many applications, particularly in alloyed form, and many uses are promised for the new alloys.

Titanium is the world's fourth most plentiful metal but has been little used in metallic form in the past because of difficulties in separating it from the minerals in which it is formed by a commercially economical process.

Zirconium is not as plentiful as titanium but it is more abundant than such common metals as copper, nickel and lead. Its separation is also a problem. But methods have been developed recently by the Bureau and by private industry by which both titanium and zirconium may be economically obtained. Both promise to become important metals in everyday use.

The Bureau, in cooperation with the U. S. Air Force, has been making an extensive study of zirconium alloys during the past four years. More recently it has directed that study to a more detailed investigation of a selected group of alloys, particularly with titanium, a much lighter metal. It has just issued a report of this work, a copy of which can be obtained without cost from the Bureau of Mines office at 4800 Forbes St., Pittsburgh. Its title is "Zirconium-Titanium System; Constitution Diagram and Properties."

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Radar is coming into wide use clocking car drivers as they speed along highways.

Antlers shed annually by deer are often destroyed by mice and other rodents for the minerals they contain.

Question Box

Photographs: Cover, Milt Young and Bob Richardson; p. 50 and 51, Gulf Oil Corporation; p. 53, University of Illinois; p. 55, B. F. Goodrich.

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METEOROLOGY

Weather Pattern Repeats

Weather conditions bringing storms to Northwest, warmer than usual weather to the rest of the nation remarkably like those during the 1949-50 season.

➤ COLD WEATHER and storms in the West—such as have marooned trains in California and Nevada—will re-occur periodically until mid-February.

Warm weather, and some much warmer than usual, in the rest of the nation will also re-occur periodically during that time.

This is the prediction of the U. S. Weather Bureau's Extended Forecast Section. The weather pattern is due to the presence in the Pacific about mid-way between Alaska and Hawaii of a great anticyclonic movement of winds in the air between 10,000 and 30,000 feet up.

These weather conditions are remarkably like the weather in this country during the winter of 1949-50 and for the same reason. An anticyclone—whirling winds around a center in a clockwise direction—in just about the same position, did just about the same things to the weather.

Our weather is influenced by a great wind current which travels around the northern hemisphere from west to east. This anticyclone is forcing that current to bulge northward over the northern Pacific. That forces a corresponding bulge to the southward down over the western United States and another bulge to the northward at just about Cape Hatteras.

This brings the cold weather down to the Pacific Northwest from Alaska, and warm weather up to the southeastern United States from the Gulf regions.

Jerome Namias, chief of the Extended Forecast Section, calls this close duplication of these weather conditions remarkable—something he never expected to happen again in his lifetime, until he foresaw indications of it in mid-December.

In 1949-50 this anticyclone kept reappearing, moving northward across the Aleutians into the Bering Sea. The weather pattern over the United States generated through the influence of the anticyclone also persisted through February.

If the 1951-52 anticyclone continues to copy its older brother of two years ago, we might expect the same things to happen to our weather again.

In almost exactly the same words as used Jan. 15, 1950, the Extended Forecast Section predicts for the period to mid-February that temperatures will average below seasonal normals west of the Continental Divide and in the northern plains but above normal elsewhere.

"The most unseasonably warm weather is expected in a broad belt from the Ohio valley southwest to Texas, while the coldest departures from normal are indicated in the Pacific Northwest," the forecast said.

Snow and rain will exceed normal in the central and northern plains, the Great Lakes region and the Pacific coast states. Sub-normal amounts of rain are indicated in the South. Elsewhere near normal amounts are in prospect.

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ENGINEERING

Electronic "Brain" Joins U. S. Army in February

➤ AN ELECTRONIC "brain" is graduating from the University of Illinois next month, and, like many February graduates, will "join" the U. S. Army.

The high-speed computer's assigned post is the Ballistics Research Laboratories, Aberdeen Proving Ground, Md., where it will be used to help prepare gunfire tables and other involved mathematical problems. The machine's twin, whose parts were built at the same time in order to cut costs, will remain on the campus after it is completely assembled in June.

Built under contract with the Ordnance Corps of the Army, the graduating computer is named ORDVAC, from Ordnance Variable Automatic Computer. Cathode-ray tubes, similar to television picture tubes, but only three inches in diameter, make the memory unit. The "memory" appears as glowing green dots on the face of the tube, 1,024 digits arranged in a square, 32 dots high and 32 dots wide.

Memory tubes store not only numbers, but also directions of what to do. In two weeks this machine can solve mathematical problems that would take a human more than a thousand years.

Computing machines which use magnetic drums as memory elements and those which use mercury memory storage elements are both being made commercially. No commercial organization has yet completed a machine with the electronic memory of the kind used in ORDVAC.

The National Bureau of Standards has two machines with ORDVAC-type memories, and Massachusetts Institute of Technology has one. Another ORDVAC type machine is now under construction at the Institute for Advanced Study in Princeton, N. J., where fundamental work pertaining to this type of machine was originally carried out by Dr. John von Neumann and co-workers.

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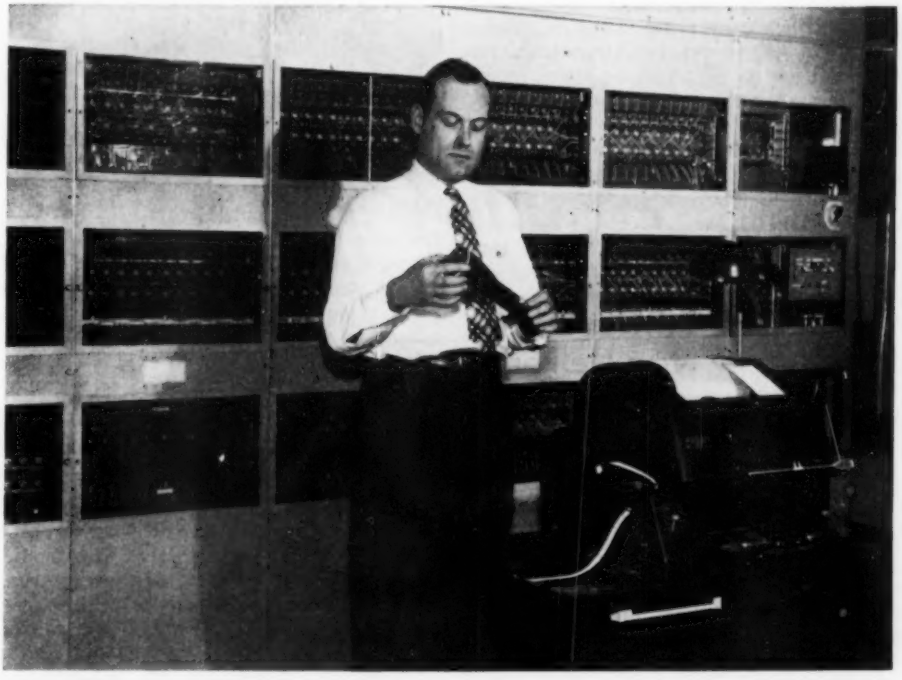

"ELECTRONIC BRAIN GRADUATE"—This high-speed computer is "graduating" from the University of Illinois in February, and, like many other graduates, will "join" the U. S. Army, solving problems in ballistics at the Aberdeen Proving Ground, Md. Prof. Ralph E. Meagher is holding one of the cathode ray memory tubes.

RADIO

Saturday, Feb. 2, 1952, 3:15-3:30 p.m. EST

"Adventures in Science," with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Dr. Harlow Shapley, director of the Harvard College Observatory, Cambridge, Mass., discusses "Exploring the Universe."

MEDICINE

Drug Quiets Hangover Nervousness Quickly

➤ HANGOVER SHAKES, nervousness and "butterflies in the stomach" can be relieved, often in half an hour to an hour, by a drug called Dimethylane, four Philadelphia physicians report.

In their studies, 42 patients recovering from "an acute bout of intoxication" swallowed this drug in gelatin capsules four times a day. The drug was stopped whenever a patient was free from the nervousness and trembling for four hours.

The average time required to free the patients from their symptoms was just under 24 hours (23.8 hours). Fourteen recovered within 12 hours or less. By contrast, patients given a barbiturate sleeping pill required an average of 38.3 hours to recover.

The drug did not cause any toxic symptoms and has a "wider margin of safety and greater activity" than Myanesin, another relaxing drug which has been used in place of barbiturates to relieve postalcoholic jitters.

Dimethylane's chemical name is 2,2-di-isopropyl-4-hydroxymethyl-1,3-dioxolane. Its successful use for postalcoholic jitters, medically termed psychomotor agitation, is reported to fellow physicians by Drs. Martin D. Kissen, H. Edward Yaskin, Harold F. Robertson and David R. Morgan in the QUARTERLY JOURNAL OF STUDIES ON ALCOHOL (Dec. 1951).

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CHEMISTRY

Soybean Oil Off-Flavor Removed by New Method

➤ A WAY to get rid of the beany off-flavor of soybean oil so that it will not come back on standing has been found by U. S. Department of Agriculture scientists.

Present methods remove the beany taste of this oil, but only temporarily. After standing, the off-flavor returns. The beany taste, the scientists have found, is due to the presence of highly unsaturated linolenic acid. In the laboratory this off-flavor can be removed by saturating only the linolenic acid. Methods are now being tried to find commercial ways for making this acid saturated without affecting the rest of the soybean oil, states Dr. George W. Irving, of the Bureau of Agricultural and Industrial Chemistry.

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ENTOMOLOGY

Party Line for Bees

Soviet Russian bees now ordered to follow the party line instead of traditional beeline. Both U. S. and Russia having trouble with bees.

➤ SOVIET RUSSIAN bees now are being ordered to follow the party line instead of the traditional beeline. They must fly straight to flowers of the Red Minister of Agriculture's choice.

American bee experts do not think the bees will bow easily to Red orders. They think the commissars are not taking the bees' intelligence into account.

Both countries are having serious trouble with bees. The bee is one of nature's chief agents for producing seeds of grasses and clover used in crop rotation, of alfalfa for cattle fodder, and of many other plants. Production of seeds in this country through pollination by bees has gone down in the past 25 years, mostly through neglect by American farmers.

Now the Russians claim they have trained hordes of bees to seek nectar and pollen from specific plants chosen by the farmer, ignoring all others. The claim is made in an article appearing in the 1951 annual edition of VOKS Bulletin, publication of the U.S.S.R. Society for Cultural Relations with Foreign Countries.

James R. Hamilton, bee expert for the U. S. Department of Agriculture, doesn't think the Russians have been able to train bees, despite their claims. He says the bees are too smart to be forced into ignoring sweeter nectar and more nutritious pollen elsewhere.

The Soviet article, written by I. Khalifman, Stalin prize winner, says that the bees were trained by using the principles established by Ivan Pavlov, Soviet psychologist and expert on conditioned reflexes in animals.

Bees were fed on syrup flavored with the plant which it was desired to pollinate, according to Mr. Khalifman. Then, when released, they went straight to those plants. One day, it was claimed, 2,225 of a group of yellow Caucasian bees which had been fed on red-clover-flavored syrup went to the red clover patches, while 2,250 black central Russian bees, previously fed on heather-flavored syrup, made a beeline for heather flowers. That evening, the experimenters, according to Mr. Khalifman, switched brands on the bees, giving the yellow Caucasian hives shots of heather, and setting up drinks of red clover for the black bees.

Three days later, says Mr. Khalifman, 2,875 yellow bees sipped nectar from heather plants, while 2,837 black bees drank their fill of red clover.

The bees became so well-trained, the Stalin prize winner claims, that they could tell one brand of grape from another.

Mr. Hamilton pointed out to SCIENCE SERVICE that the Russians were basing their bee-training experiments on work of an eminent Austrian bee expert, Dr. Karl Von Frisch. Dr. Von Frisch, according to Mr. Hamilton, had, in the laboratory, succeeded in training bees to a certain extent. But experiments in the field along those lines both in this country and in Holland showed, according to Mr. Hamilton, that the bee was not to be fooled with a little classroom work with one brand of nectar. If better brands were available, the bees sooner or later would find them.

Mr. Hamilton points to great advances in this country made in pollination and production of seeds through placing bee hives close to or right in the middle of fields of the desired plants. Average production of alfalfa seed in California per acre three years ago, he said, was 275 pounds. Using five colonies of bees per acre on a 132-acre plot, a production of 1,128 pounds of seed per acre was achieved.

Mr. Khalifman claims in his article that this system can be discarded in favor of the trained bees. Mr. Hamilton said that they may have thought they needed to discard it because the smart bees, once they became oriented to new surroundings, found greener fields beyond the desired area. Americans solve this problem by moving the colonies before they become too well oriented.

Mr. Hamilton pointed out that the decline in this country of production of seeds by bee-labor is a serious thing. Utah, he said, produced 25,000,000 pounds of alfalfa seeds this way in 1925. Now the rate is 3,000,000 pounds a year. Using bees in the fields through this new American method promises to send the rate up again.

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MEDICINE

World-Wide Hunt For New Diseases

➤ A WORLD-WIDE hunt for new and important human diseases is underway by the Rockefeller Foundation's laboratories in New York and in India, Egypt and elsewhere as the result of the discovery of insect-borne viruses during recent yellow fever research.

Five or more of these viruses seem to be related to known encephalitic agents capable of causing severe infections in man and animals. Field investigations and laboratory work are directed by Dr. Max Theiler, who received the 1951 Nobel prize in medicine for his yellow fever researches.

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SUPER SACK—Weary GI's in Korea are being equipped with lightweight inflatable sleeping pads, providing them a three-inch air cushion between bedclothes and the ground. They are made of nylon fabric and crack-resistant rubber by B. F. Goodrich.

ENGINEERING

Reflecting Sheeting For Rear of Autos

➤ REFLECTING SHEETING outlining the rear of a motor vehicle, to lessen danger of rear-end collisions, was recommended at a meeting of the Highway Research Board of the National Research Council in Washington.

Night-time motorists can see a vehicle outlined with reflective sheeting 70% faster than one that is non-reflecting, the board was told by Dr. A. R. Lauer of the Iowa State College Driving Research Laboratory.

One of the most serious types of highway accidents during hours of darkness is the rear-end collision, he said. Research shows that drivers approaching a stalled truck at 50 miles an hour will see it a full second earlier if the truck is reflectorized. This second gives him an extra 73 feet of stopping space, the safety margin to avoid a collision.

As a result of many tests, he continued, it was found that drivers traveling at 50 miles an hour needed over two and one half seconds to determine the relative speed of a black truck with conventional tail-lighting. Only one and one half seconds were required for the same truck when its rear end was reflectorized with either a border outline or checkerboard pattern of equal area.

BIOCHEMISTRY

Mold Remedy Sweet News

Both more honey and aid for patients with amebic dysentery promised from antibiotic fumagillin which originally looked as though it would be a dud.

➤ ONE OF the new mold remedies, or antibiotics, is making sweet news today, both literally and figuratively.

It promises more honey because it can stop infectious Nosema disease of adult honeybees. And it is living up to its promise, reported by SCIENCE SERVICE just a year ago, of becoming good medicine for amebic dysentery, or amebiasis.

This antibiotic's name is fumagillin. Originally isolated from an aspergillus organism by Drs. F. R. Hanson and E. J. Eble of the Upjohn Company, fumagillin at first looked almost like a dud because it showed little or no activity against bacteria or fungi and no activity against influenza in mice or MM virus in the test tube.

Two groups of doctors report good results with fumagillin in treatment of human and monkey patients with amebiasis. First sign of this potential usefulness of fumagillin came from the report last year that it was an extremely powerful killer of amebas, the germs that cause amebic dysentery, and that it acted directly on the amebas both in the test tube and in rats. This was discovered by Drs. Max C. McCowen, Maurice E. Callender and John F. Lawlis, Jr., of Lilly Research Laboratories, Indianapolis.

The trials on human patients show that fumagillin is "essentially" non-toxic and clears up the infection at least in patients who do not have severe amebic infection. Dr. Hamilton H. Anderson of the University of California School of Medicine, San Francisco, reported his results with the drug at the New York Academy of Sciences conference, while Drs. John H. Killough, Gordon B. Magill and Richard C. Smith, of U. S. Naval Medical Research Unit No. 3 in Cairo, Egypt, report their results through the journal, SCIENCE (Jan. 18).

Finding that fumagillin would cause a "striking reduction" in the number of honyebees infected with Nosema germs was made by Drs. H. Katznelson and C. A. Jamieson of the Canadian Department of Agriculture at Ottawa. This widespread disease may cause extensive losses of adult workers and queen bees in winter or spring. The Canadian scientists point out, in their report to the journal, SCIENCE, that the final test of the practicability of fumagillin in controlling the disease will have to be made with infected colonies over the winter, since the disease is most serious in overwintering colonies.

ENGINEERING

Power Line Failures

➤ ELECTRIC LINES carrying power across the country find their greatest enemies in weather and trees. Weather and trees account for the major number of overhead power failures, the American Institute of Electrical Engineers was told in New York in a joint report by engineers of the organization and of the Edison Electric Institute.

Wind is the number one weather element causing power failures with lightning as number two. Data collected from 32 utility companies show wind to be the most frequent initiating cause of failure. It causes 57% of the weather failures. Lightning causes 30% of the weather failures.

Weather conditions are responsible for 55% of the total number of overhead power failures and trees are involved in 41% of the total, according to the report. The study, begun in 1947, is to determine the causes of power line failures so that steps may be taken by the electric companies to improve their services and provide reliable power.

Reconsideration of helium for cooling large power generators was recommended to the engineers by Sterling Bechwith, Allis-Chalmers Company, Milwaukee. Supercharged hydrogen is now used. The use of hydrogen cooling has made it possible to reduce the size of generators.

"The use of a helium atmosphere for normal operation deserves reconsideration with supercharged cooling," he said, "because the smaller dimensions and more adequate cooling of the supercharged machine eliminate the ordinary objections to helium cooling to a large extent. The advantages of helium cooling from a maintenance standpoint are considerable, and construction of a helium cooled machine would also be simplified as compared with a hydrogen cooled machine."

FORESTRY

Millions of Board Feet Of Lumber Lost Each Year

➤ MILLIONS OF board feet of timber are lost each year to insects, disease and fire, Lyle F. Watts, chief of the U. S. Department of Agriculture's Forest Service, has reported.

Some of the valuable wood could be saved by quick counter-attacks. More research on insects and disease and a well-organized system of spotting infestations would aid in the battle against losses, Mr. Watts states in his annual report.

The most serious forest pests can be controlled and new pests can be prevented from entering the country, he believes. Bark beetles, particularly the Engelmann spruce beetle, are among the most destructive forest insects. An amount of national forest timber equal to the lumber required for 400,000 five-room houses has been destroyed in Colorado during the past 10 years by this spruce beetle. Totaling more than 4 billion board feet, this is 16 times more timber than was killed by fire in the past 30 years in the entire Rocky Mountain region.

In 1951, national forests returned to the U. S. Treasury $1,194,000 more than the total cost of their protection and management, Mr. Watts stated, and during the year, the highest cut in the history of the Forest Service was made from them.

More than half of the commercial forest land is still being handled poorly or destructively, he reports. On only one-fourth of the commercial forest lands, mostly public and large industrial holdings, is management good. On the other fourth, management is fair.

Science News Letter, January 26, 1952

PHYSICS

How to Remove Odors From Home Freezer

➤ IF YOU have a home freezer or are thinking of getting one, you may sometime find yourself with the problem of an unpleasant odor resulting from food spoiling because of a power cut-off. Fortunately, this does not happen often.

Just because it is a rare occurrence, you may want to cut out and keep these suggestions for removing odors from the freezer. They come from Dr. Earl McCracken, physicist in household equipment laboratories of the U. S. Bureau of Human Nutrition and Home Economics:

First try washing all the interior surfaces of the freezer with plenty of soap and water. Then go over them with a cloth wrung from clear water. Wipe dry. If this does not dispel the odor, wash the freezer with soda water, using 1 teaspoon baking soda to each quart of warm water. If the odor persists, try vinegar, using about one cup to a gallon of water, or household ammonia in the same proportions.

But if none of these suggestions prove effective, don't give up. Try using heat to bring out the odor particles and get them into the air. To do this put something like a toaster or electric heater inside the freezer to heat it up. Then use an electric fan a couple of hours to blow the air out.

Activated charcoal, put into the warm freezer will absorb odors released by the heat. Or a commercial, wick-type air freshener may be put into the warm freezer for the same purpose.

If only traces of the smell remain, this is not likely to affect food frozen and stored in the freezer if care is taken to wrap the food securely. When a package is taken out remove the wrappings as soon as possible and dispose of them at once.

When the odor has been removed or reduced to where it is of no consequence, Dr. McCracken suggests a final washing of the inside surfaces of the freezer with soda water. Activated charcoal left in for a while will pick up any residual odor.

Science News Letter, January 26, 1952

TECHNOLOGY

Concrete Wall Panel Has Center Fiber Glass Layer

➤ CONCRETE SLABS with center layers of glass fiber, already in experimental use, are designed to lessen the cost of masonry construction and provide an insulating sandwich wall for commercial, industrial and residential use.

The slabs are factory-made. They are shipped to the job after a 12-day curing period ready for installation. They are five inches in thickness and are made in sizes from eight-by-eight feet to eight-by-30 feet. Edges of the standard panels are tongue and groove on all four sides to produce an interlocking joint. One side has a facing of muslin cloth, the other a rough broom finish.

The slabs are cast in a flat position with the muslin on the bottom form plate. A concrete mixture and wire mesh are placed on this. Over it is put a layer of pre-formed glass fiber and another layer of concrete. After setting the slabs are cured for two days in a chamber at 120-degree temperature and 100% humidity. Then they are cured in the factory yard for ten days.

These slabs can be used as a curtain wall to be attached to structural iron or as a load-bearing wall. Owens-Corning Fiberglas Corporation, Toledo, Ohio, whose product is used for the center layer, states this new sandwich wall is meeting with great favor among builders because of the speed with which it can be erected. It saves up to 40% in masonry cost, it is claimed, and is highly durable because of less joints.

Science News Letter, January 26, 1952

IN SCIENCE

AGRICULTURE

Weed-Killer Makes Possible Apricots as Big as Peaches

➤ APRICOTS THE size of peaches may be on the market within the next few years.

A research program being conducted on deciduous fruits by Julian C. Crane and Reid M. Brooks at the University of California at Davis is more than bearing fruit.

The two California scientists have found that a weed-killer solution, when sprayed on apricot trees, not only hastens the ripening of the fruit by 18 days but increases their size considerably.

The solution, sold commercially as 2,4,5-T, was sprayed on Royal apricot trees during the time of thinning operations. The hormone application stimulated the flesh of the fruit to grow but did not increase pit size. The flesh was 21% thicker than that of unsprayed fruits.

This same spray has been known to hasten the maturity of figs, apples and peaches, but this is the first time it has increased the size of a fruit.

Since slight injury occurred on the tips of the young branches when the potent hormone weed-killer was sprayed on the apricot trees, further experimentation is necessary before commercial recommendations will be made.

Science News Letter, January 26, 1952

ICHTHYOLOGY

Counter Current Makes Fish Gills Efficient

➤ FISH UTILIZE oxygen to a high degree because in the gills the water, containing the oxygen, and the blood flow in opposite directions. Experiments reported in the journal NATURE (Jan. 5) confirm this theory of how fish use oxygen.

Drs. E. H. Hazelhoff and H. H. Evenhuis of the Zoological Laboratory at the University of Groningen in The Netherlands tested the theory by pumping water through tubing into the mouths of fish. The gills on one side of the fish were put out of action so that the exact volume and direction of water passing the other set of gills was known.

When the direction of the current was opposite to that of the blood the average oxygen utilization was about 51%; but when the water current was in the same direction as the blood, they found the average oxygen utilization was only about 9%. This "counter current principle is of high importance for the efficiency of the fish gill, and no doubt for that of other gills as well," they state.

Science News Letter, January 26, 1952

NCE FIELDS

AGRICULTURE

Orange Trees Grow 14 Years In Water and Sand Cultures

➤ WHATEVER THE opinions of organic gardeners and angle worm fanciers, plants and even good-sized trees will grow indefinitely in water cultures and produce high quality fruit, scientists at the University of California's Citrus Experiment Station in Riverside have established.

Organic matter has great value in preserving soil structure, in preventing leaching losses of soil nutrients, and in providing some insurance against nutritional deficiency in the soil. Dr. H. D. Chapman, chairman of the division of soils and plant nutrition, explains that organic matter is not indispensable.

"From our experience in water and sand cultures," he said, "we know that most green plants can be grown in a medium devoid of organic matter. For example, we have 14-year-old orange trees which have been growing continuously in water cultures during their entire life.

"These trees continue to produce good crops of fruit, are green and healthy, and the quality of the orange produced, as far as can be measured, is as good as the quality of oranges grown in soils."

Because plants are constantly extracting nutrients from the soil, restoring organic matter to the soil does to some extent replace the plant nutrients taken away.

Science News Letter, January 26, 1952

NUTRITION

Super-Good Growing Diet May Worsen Chronic Ills

➤ A HINT that a super-good diet for making children grow big and strong may boomerang and make worse some of the chronic diseases of middle and old age appears in a report from the U. S. Bureau of Human Nutrition and Home Economics.

"Combinations of food that seem to provide adequately for growth may tend to accentuate certain chronic ailments commonly associated with age," is the official wording of the report summing up research by three of the Bureau's scientists.

The research was made on rats, classic animals for nutrition studies. The rats ate rations cooked as for human consumption. The diets included such foods as round steak and pork loin, carrots, potatoes, kale, eggs, navy beans, milk, corn meal, rice, enriched bread and hydrogenated fat (Crisco).

In general, the scientists report, the diets that promoted the largest early weight gains and the heaviest adult animals also tended to promote fatness, more body sores at an earlier age and more bronchiectasis. This lung disease is considered like hardening of the arteries in man, in that both are chronic, progressive diseases which limit the life span. Body sores are usually considered a sign of senility in rats.

The rat's response to diet may not be identical with that of man, the scientists warn. A good diet for making children grow may not have any repercussions later in life. But the research does point up the fact that the over-all nourishing value of human type diets for human beings cannot be judged by the effects of the diets on rats without careful evaluation of the findings.

By keeping this in mind, however, it is believed that by feeding selected diets to rats over their entire lifespan through several successive generations, much can be learned about the influence of entire diet patterns on growth, reproduction and aging.

The scientists whose work is summarized in the annual report of the Bureau are Drs. Elizabeth Crofts Callison, Elsa Orent-Keiles and Rachel Uhvits Makower.

Science News Letter, January 26, 1952

NUTRITION

Upside Down for Your Vitamins and Vegetables

➤ IF YOU and your family, however vitamin conscious, have grown tired of vegetables, you might try a variation of the always popular upside down cake, making it with vegetables and calling it upside down vegetable squares. The recipe comes from Elizabeth Ellis, home economist of the University of New Hampshire at Durham:

- 2 cups sifted all-purpose flour
- 3 teaspoons baking powder
- ½ teaspoon salt
- ¼ cup shortening
- 1 cup milk
- 1 egg, well beaten
- 4 cups cooked vegetables (carrots, peas, celery, lima beans)
- ¼ cup vegetable water
- 2 tablespoons butter
- mushroom sauce

Sift together dry ingredients; cut in shortening. Combine egg and milk; add to dry ingredients, stirring until mixed. Arrange hot seasoned vegetables in bottom of greased shallow baking pan, add vegetable stock, dot with butter, and cover with dough. Bake in hot oven (425 degrees Fahrenheit) 20 to 25 minutes. Turn out on hot serving plate with vegetables on top and serve with mushroom sauce. Six servings.

For the mushroom sauce, Miss Ellis says to saute one dozen medium sized mushrooms in two tablespoons table fat, add two tablespoons flour. Gradually stir in one cup milk, and stir till mixture thickens. Cook about three minutes longer; add ½ teaspoon salt, ⅛ teaspoon pepper, and a few drops Worcestershire sauce. Diluted mushroom soup can substitute for mushroom sauce.

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METEOROLOGY

Atomic "Base Surge" Is Not Limited to Tropics

➤ THE "BASE SURGE" of thousands of tons of tiny radioactive water droplets mixed with air can happen in any climate. Therefore it is not safe, as was recently contended, to say that New York is forever free from the effects of an atomic base surge.

This opinion, in opposition to another opinion that base surges such as happened at Bikini in 1946 would not occur in a temperate climate, was expressed by Navy Capt. Howard B. Hutchinson in a letter sent to the BULLETIN OF THE AMERICAN METEOROLOGICAL SOCIETY for publication in a forthcoming issue. The more reassuring opinion, that New York and other temperate cities would be relatively safe from a rain of radioactive water, after an underwater A-bomb explosion, was expressed last fall by Air Force Col. B. G. Holzman. Both officers are meteorologists.

Col. Holzman contended that the original base surge, the water spewed up from the ocean in the form of an aerosol by the underwater blast of the A-bomb, was greatly enlarged at Bikini by the large amount of moisture in the warm, tropical air. Thus the danger of deadly radioactive rain with which the ships were covered was multiplied.

Capt. Hutchinson, on the other hand, points to two base surges which he said occurred in temperate climates, one at sea and the other on land. The first was after the explosion of an ammunition ship, the "John Burke;" the second occurred when 160 tons of TNT was exploded at Dugway, Utah, last spring. Neither the climate, Capt. Hutchinson said, nor the depth of the water or even the absence of water, had anything to do with the formation of base surges in these cases.

Science News Letter, January 26, 1952

INVENTION

Bed Lengtheners Give Comfort to Tall Man

➤ THE OVERLY tall man can now have a bed of comfortable length wherever he may be. All he needs to do is carry with him on his travels a pair of bed-lengtheners to install as extensions on the side rails of the bed.

This bed-lengthener is an adjustable device which can be extended or shortened. All one has to do is disconnect the rails where they are attached to the foot-board. Then the extender is hooked into the slots on the foot-board and the hooks on the side rail fixed into slots on its other end.

Inventor is Glenn Hill of Los Angeles. Patent 2,582,035 was his award. Rights are assigned to Irvin A. Brock of Los Angeles.

Science News Letter, January 26, 1952

ASTRONOMY

See Planets Early or Late

To spot planets visible during February, you will have to scan skies both early and late. Total solar eclipse scheduled for Feb. 25. Partial moon eclipse occurs Feb. 10.

By JAMES STOKLEY

➤ TO SEE any planets in the February evening sky, one will have to look either early or late.

Jupiter, which has been so brilliant during recent months, is still with us but sets about 10:00 p.m. at the beginning of February. It is in the constellation of Pisces, which is seen in the southwest around 7:30, and because Jupiter is so bright one can locate it easily.

Saturn, the next planet to appear, is in the constellation of Virgo, the virgin, and rises around 10:30 at the beginning of February. It is considerably fainter than Jupiter, though still ranking with the first-magnitude stars.

Still later, about midnight, Mars appears in Libra, the scales, shining slightly more brilliantly than Saturn. Finally Venus, now a morning star, rises in Sagittarius, the archer, about two hours ahead of the sun.

Since the accompanying maps depict the sky as of 10:00 p.m., your own kind of standard time, at the first of February; an hour earlier at the middle of the month and two hours earlier at the end, none of these planets are shown upon it. But they do show the stars, still at mid-winter brilliance.

Sirius Is Brightest

Brightest of these is Sirius, the dog star, in Canis Major, the great dog, which is seen directly south. In the part of the sky above Sirius there are more stars of the first magnitude than in any other area of comparable extent.

Above and to the right of Sirius we see Orion, the great warrior, in which there are two of these brilliant orbs. One is Betelgeuse and the other is Rigel.

Between these two are three stars in a row that form the warrior's belt. Though not of the first magnitude, they are a characteristic feature of this constellation. Continuing past Orion, still higher and farther right, we arrive at Taurus, the bull, with bright Aldebaran.

Going upwards from Taurus brings us to Auriga, the charioteer, in which Capella shines. Below this, towards the southeast, are Gemini, the twins, of which the star Pollux is also of the first magnitude. And below Gemini, towards Canis Major, is Canis Minor, the lesser dog, with Procyon.

Another first-magnitude star is visible to the east, in the figure of Leo, the lion. This constellation contains a sub-group, called the sickle, and Regulus is at the end of the handle of this implement.

February brings the year's first two eclipses, and the only eclipse this year that is visible in the United States. This is a slight partial eclipse of the moon, on Sunday evening, Feb. 10. It will be over by the time the moon is visible in the western part of the nation, but it will be easily seen in the central and eastern states.

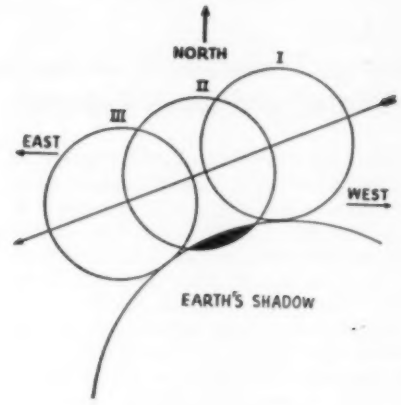
The second is a total eclipse of the sun, on Feb. 25, which will not be seen at all in the Americas. The path along which the total eclipse may be observed crosses Africa, including the troubled Anglo-Egyptian Sudan, Arabia, Iran and Siberia.

Astronomers Observe Eclipse

Despite the political unrest in these areas, it seems that a number of astronomers will be located along this line, to make the numerous observations of the sun that are possible only when its brilliant disk is temporarily hidden by the moon. Over a much larger area, including all of Europe and most of Asia and Africa, a partial eclipse will be observed.

Since the earth and moon are both solid and opaque bodies, they cast shadows behind them where the sun's rays cannot reach, and these shadows cause eclipses. Where the moon's shadow, which tapers to a narrow region not more than a hundred miles or so in diameter, touches the earth, there is a total solar eclipse, like that on Feb. 25.

Because the sun is so much bigger than the earth, our planet's shadow likewise tapers to a point. But since the earth is larger than the moon, our's is so big that the moon can enter into it completely, producing a total lunar eclipse.

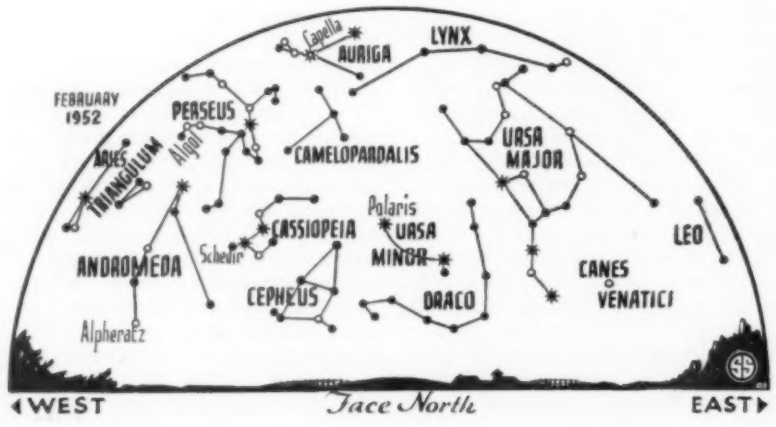


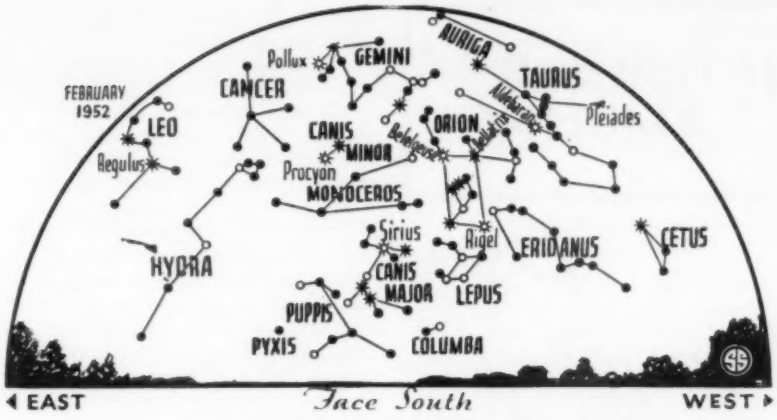
On the evening of the tenth, however, this does not occur, but one edge of the moon's disk is shaded. At its height only about 8% of the lunar diameter will be obscured.

The accompanying diagram shows the three principal stages of this eclipse, with the small circles representing the moon. The beginning is at I, with the lunar disk just making its first contact with the edge of the earth's shadow. This will occur at 7:03 p.m. EST. (Subtract one hour for Central, two for Mountain and three for Pacific Standard Time.)

At II it is the middle of the eclipse, when the largest part of the moon is in shadow. This comes at 7:39 p.m., EST. The ending is shown at III, when the moon has just left the shadow. This comes at 8:15 p.m.

Those who are fortunate enough to be in a part of the country where the middle of the eclipse is visible—and to have clear weather—will easily see the curved edge of the terrestrial shadow on the moon's surface. This will not be completely dark. Even when there is a total lunar eclipse, the moon does not completely disappear.





☼ ✱ ○ • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

The atmosphere which surrounds the earth acts as a prism, bending some of the sun's rays into the shadow. But as these rays pass through the layer of air, much of their blue light is scattered, which gives the daytime sky its usual color. With blue removed, the remainder is predominantly red, and so the eclipsed portion of the moon has a distinctly ruddy hue.

Celestial Time Table for February

Feb.	EST	
2	3:01 p. m.	Moon at first quarter
8	4:00 a. m.	Moon farthest, distance 252,300 miles
9	1:53 a. m.	Algol (variable star in Perseus) at minimum
10	7:28 a. m.	Full moon and partial lunar eclipse
11	10:42 p. m.	Algol at minimum
14	7:36 p. m.	Algol at minimum
15	8:58 a. m.	Moon passes Saturn
17	10:00 a. m.	Moon passes Mars
	4:24 p. m.	Algol at minimum
18	1:01 p. m.	Moon in last quarter
22	9:39 p. m.	Moon passes Venus
23	5:00 p. m.	Moon nearest, distance 223,800 miles
25	4:16 a. m.	New moon; solar eclipse in Africa, Europe and Asia
28	2:40 a. m.	Moon passes Jupiter

Subtract one hour for CST, two hours for MST, and three for PST.

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MEDICINE

Pain in the Neck Causes

➤ YOU CAN get a pain in the neck—a real pain—from at least 43 different things. A list to help other doctors has been compiled by Drs. James E. Watson, Jr., and Sylvester W. Thorn of Houston, Tex.

It starts with "sore throat," includes spine injury and tumors and ends with heart disease.

(Not listed by the Houston doctors are such common causes as mothers-in-law, cranky bosses, tardy secretaries, neighbors' children, income taxes and a few others that can be diagnosed without a doctor's aid.)

The official list is given doctors in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (Jan. 5).

One of the medical causes of pain in the neck attacks children only. It is Bezold's abscess on the membrane covering the temporal bone at the side and base of the skull.

A pain in the neck and swelling that may come at the sight, smell or thought of food or during a meal, sometimes making it impossible to finish the meal, is caused by an obstruction of a passage from a salivary gland.

The pain of a "crick in the neck," acute wry neck, acute pain or inflammation of a neck muscle, usually starts suddenly on awakening after sleep or follows exposure to inclement weather. It is usually accompanied by some of the symptoms of a cold, affects the back neck muscles and is made worse by jarring or sudden movement of the neck. The patient holds the neck rigid in the position of least pain and the affected muscles may be tender and taut.

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TECHNOLOGY

Oil Extracted From Fruit Skins by French Machine

➤ THEY'RE STRIKING oil in Morocco by a new process—oil from fruit skins.

Tiny globules of oil are now burst out from citrus fruit skins with a new industrial extractor machine, described by Roger Schwob, chief of the division of technology of the Institut des Fruits et Agrumes Coloniaux, Paris.

The machine presses the skin and bursts open tiny glands to release this essential oil used in food seasoning and perfume. Fruit oil is usually extracted by hand or with a water solution that spoils the quality and wastes time, Mr. Schwob pointed out. With this new machine, the skin of an orange, grapefruit or lemon can be de-oiled in seven seconds and the fruit itself is left intact for further processing.

About 4,200 fruits per hour can be processed for oil. The machine adjusts automatically to all shapes, sizes and varieties.

Americans long have valued fruit juice and thrown away the skins, said Mr. Schwob. And Italians have concentrated on extracting only the essential oils. New economic conditions, however, make it difficult to be content with extracting only one product to the detriment of the rest.

With the industrial extractor machine now in use in Morocco, oil can be drawn out entirely at cold temperatures and without water, two conditions essential to get the highest quality of this fragile product.

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ORNITHOLOGY

NATURE RAMBLINGS

Tree Sparrow

➤ WE SHALL not have the tree sparrows with us much longer. They came down out of the north when winter arrived, and they will stay as long as snow is on the ground.

About the time the first robins come up from Dixie, however, and certainly when the first bluebird is seen, they will begin drifting northward again. For the tree sparrow is distinctly a Canadian, and only comes "down to the States" for the winter.

Where the tree sparrow got its name is one of the unanswered puzzles of popular nomenclature, for it does not ordinarily stay around trees very much, and is very rarely known to nest in trees. It is most distinctively a ground sparrow, sticking close to the floor of things, and foraging there for its rations.

He is one the few birds that can "look our winters in the face and sing." Not a loud song, to be sure, but sweet and sure though slight, and the more welcome for the frozen silence through which it often sounds. Only the severest of Januaries is able to quell the tree sparrow.

Very alert, bright, cheerful little birds these tree sparrows are. They flit in small flocks like brown leaves swirling over the snow, settling on weed stalks and making the chaff fly while they devour the seeds, singing in their low, clear trill or chattering in brief, tinkling chirps.

A quarter of an ounce of weed seed a day is set down by one naturalist as a fairly conservative estimate of the ration for a tree sparrow. He figures on this basis that in a large agricultural state like Iowa, this species alone removes 875 tons of weed seed every winter. No farmer will begrudge a full harvest of such gleaners.

To the careless observer, there is a great resemblance between the tree sparrow and that city gamin, the English sparrow, which an ornithologist named Job, with a most un-Job-like impatience, has characterized as "no sparrow at all, but a rat in feathers." However, in addition to a greater neatness and trimness, the tree sparrow bears a black mark on his breast which shows him as a member of a more decent clan than his disreputable cousin.

When the first warm days of spring come, the tree sparrows feel the call of their deep Northern woods, and disappear in the direction of their nesting grounds.

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AERONAUTICS

Friction Heat Problem

➤ NOW THAT airplanes have traveled faster than sound and broken the so-called sonic barrier, predicted unbreakable a few years ago, they are encountering another barrier only partially solved. This is a thermal barrier, which is due to the heat generated by air friction at high speeds.

This problem of a thermal barrier is discussed in a publication of the Royal Aeronautical Society, London, by Dr. W. F. Hilton, an engineer with the Armstrong Whitworth aircraft company. The heat developed by any flying body, bullet, aircraft or space rocket, rises roughly in proportion to the square of its speed, he states. This means that if the velocity of a speedy plane is doubled the aircraft's temperature will rise four times.

In actual practice, he adds, the effects of this square-of-the-speed law have to be qualified somewhat due to the change in temperature with height and to aerodynamic shape. It also takes time for the heat to soak into the plane. Again, the steady decrease of air density with height reduces the temperature rise until it becomes negligible at an altitude of some 70,000 feet.

With the development of jet-propelled airliners for commercial passenger transportation, the problem of the thermal barrier will be important, he indicates. Cabins can easily become uncomfortably hot, particularly when flying in the tropics.

These speedy airliners will require a cabin-cooling system somewhat similar to a type now in use in jet fighting planes. The cockpit-size refrigerator now used consists of a device that compresses hot air from the jet engine and then lets it expand rapidly to below the freezing point. This produces cool air to circulate in the cabin.

Any form of engine using mechanical compression of air is likely to be limited to a speed of less than three times that of sound and the use of a ram-jet engine will be limited to from four to five times the speed of sound. The rocket-powered aircraft alone may be able to fly at these very high speeds because it carries its own oxygen and the only thermal barrier problem is the heating up of the outside of the structure.

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GENERAL SCIENCE

Program for Indonesia

Aggressive plans for getting rid of illiteracy, changing food habits, expanding medical services and doing fundamental research are projected by Indonesian scientists.

➤ INDONESIAN SCIENTISTS and educators are projecting an aggressive program aimed at obliterating their nation's illiteracy, changing the people's food habits, expanding health and medical services and, at the same time, conducting fundamental research.

This was brought out in a series of interviews with some of the young republic's top officials by Borge Michelsen, field scientific officer for the United Nations Educational, Scientific and Cultural Organization, stationed at Djakarta.

A primary education for all of the country's 11,000,000 school children by 1960 is the aim of Dr. Wongsonegoro, Indonesian Minister of Education. This means the training of 250,000 school teachers. At present there are only 80,000.

The education minister also talked of plans for adult education and for calling in scientists from abroad to act as teachers for future Indonesian scientists and to help raise the standard of living.

Dr. Sutomo Tjokronegoro, professor of pathology at the University of Djakarta, pointed to the fact that there is only one physician for 70,000 persons in Indonesia—compared with about one for 1,000 in the United States. His country, he said, is planning an expansion in the training of "mantris"—a kind of health sergeant. They would be set up in polyclinics all over the country. Physicians would be in charge of several polyclinics.

Dr. Sutomo also stressed the need to bring in foreigners, both teachers and research workers. Every doctor, he said, ought to be a bit of a research worker.

Research is important to find the medicines the country needs, he pointed out. Indonesia cannot afford to pay for the new wonder drugs produced in the United States, many of which are patented.

Dr. Poorwo Soedarmo, head of the Nutrition Institute, Djakara, must tackle the fact that the average Indonesian has a daily intake of only 43 grams of protein—a low record for the world. (One ounce is about 30 grams.) Fifty grams is considered the minimum for a human being. (The National Research Council in Washington, D. C., recommends 70 grams of protein per day for men, 60 grams for women.) In some parts of the country it is not uncommon to hear of a person dying of what is called "normal" starvation.

A program to change the patterns of food production so the people will eat more leafy vegetables, roots and meat is under way. The object is to raise not only the protein intake but also to provide needed vitamins.

In order to get the people to change their eating habits, a popularization of science is necessary so that the people understand why they should eat new foods, he said.

Brigades of Indonesian scientists and fundamental research in biology are goals of Dr. Kusnoto, director of the Botanical Garden, Bogor. He would like to see a fundamental research program in plant growth hormones, which might mean an increase in copra production.

For the next five to ten years Indonesians desperately need the help of the outside world—teachers and research workers—in the opinion of Prof. Sarwono Prawirohardjo, gynecologist and obstetrician. After that Indonesia can probably proceed on its own.

Admitting that there are still many areas of his country where belief in witchcraft is still widespread. Prof. Sarwono called for teaching science to the school children.

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OPTICS

Sunglasses by Day Improve Seeing by Night

➤ GIRLS WHO wear sunglasses during the day may have some justification besides fashion. If they are going to drive an automobile at night, they may be safer if they have protected their eyes from glare.

This is the suggestion from a report by Dr. Robert H. Peckham of Temple University School of Medicine, Philadelphia, to the Highway Research Board meeting in Washington. A large majority of drivers exposed to moderate sunlight during the day may not be able to see well enough for safe night driving, his studies on the effects of sunlight on eye sensitivity show.

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Books of the Week

TO SERVE YOU: To get books, send us a check or money order to cover retail price. Address Book Dept., SCIENCE NEWS LETTER, 1719 N St., N. W., Washington 6, D. C. Ask for free publication direct from issuing organization.

THE ANATOMY OF COMMUNISM—Andrew MacKay Scott—*Philosophical Library*, 197 p., $3.00. In this critical analysis of the Marxian theoretical system and its relation to Communist practice, the author finds that the trouble with Marxian ideas "is not that they are wholly false but that they are only partly true."

ANNUAL REPORT FOR THE YEAR ENDING JUNE 30, 1951—*American National Red Cross*, 62 p., illus., paper, free upon request to publisher, 17th and D Sts., N. W., Washington 13, D. C. An accounting to the American public of what it has done through its Red Cross.

CONCERNING FOOD AND HEALTH: A Report to the Public on a Decade of Adventure in Science, 1942-1951—*The Nutrition Foundation, Inc.*, 73 p., illus., paper, free upon request to publisher, Chrysler Building, New York 17, N. Y. Since its organization in 1941, the Foundation has done much to encourage basic research in nutrition and to help the public become aware of and use the nutrition knowledge now available.

THE CONSERVATION OF PAINTINGS—Robert L. Feller—*Mellon Institute*, 4 p., illus., paper, free upon request to publisher, 4400 Fifth Ave., Pittsburgh 13, Pa. Reprinted from *Carnegie Magazine* for January, 1952.

EARLY MAN IN THE EDEN VALLEY—John H. Moss and others—*The University Museum*, 124 p., illus., paper, $1.50. These papers on the geologic, archaeologic, paleobotanic and paleontologic studies at the site, near Eden, Wyoming, of the original discovery of "Yuma" artifacts, are intended to provide a better basis for relating "Yuma" culture with the history of Early Man in North America.

EX-ITALIAN SOMALILAND—E. Sylvia Pankhurst—*Philosophical Library*, 460 p., illus., $7.50. The various stages of the Italian occupation of the Somaliland colony and its present position are discussed. The lack of information about Somaliland's people and the "appallingly harsh" conditions of their life are deplored.

HOW MUCH DO YOU KNOW ABOUT ALCOHOL?—Thomas R. Carskadon—*Association Press*, 31 p., illus., paper, 10 cents. Some popular opinions about alcohol and its effects are confronted with scientific fact and common sense.

INTERRELATIONS BETWEEN DISTILLATION CURVES—John R. Bowman, *Mellon Institute*, 3 p., paper, free upon request to publisher, 4400 Fifth Ave., Pittsburgh 13, Pa. Reprinted from *Industrial and Engineering Chemistry*, November, 1951.

MARKET DISEASES OF FRUITS AND VEGETABLES: Apples, Pears, Quinces—Dean H. Rose, L. P. McColloch, and D. F. Fisher—*Govt. Printing Office*, USDA Miscellaneous Publication No. 168, revised ed., 72 p., illus., 55 cents. Designed to help in recognizing and identifying economically important diseases of fruits and vegetables, this publication also gives information on prevention.

PENICILLIN DECADE, 1941-1951: Sensitizations and Toxicities—Lawrence Weld Smith and Ann Dolan Walker—*Arundel Press*, 122 p., $2.50. This review of the published data on undesirable effects of penicillin leads the authors to conclude that "While the actual *toxicity* of penicillin is almost negligible, its ability to sensitize and to cause serious and even fatal accidents should not be minimized." The bibliography lists 342 references.

SEARCH FOR THE SPINY BABBLER: An Adventure in Nepal—S. Dillon Ripley—*Houghton*, 301 p., illus., $4.00. The story of an ornithological expedition to this remote, nearly inaccessible country.

SHOULD I RETIRE?—George H. Preston—*Rinehart*, 181 p., $2.50. Factual information on the mental and physical health, and economic aspects involved in retirement.

SHRUB PLANTINGS FOR SOIL CONSERVATION AND WILDLIFE COVER IN THE NORTHEAST—Frank C. Edminster and Richard M. May—*Govt. Printing Office*, USDA Circular No. 887, 68 p., illus., paper, 30 cents. Observed results of test plantings made in the late 1930's are the basis for the recommendation of 23 species.

THE THEORY OF ATOMIC SPECTRA—E. U. Condon and G. H. Shortley—*Cambridge*, 441 p., illus., $11.00. A reprint, with corrections, of this standard work first printed in 1935.

USE OF CHEMICAL ADDITIVES IN FOODS—Food Protection Committee—*National Research Council*, 24 p., paper, single copies free upon request to publisher, 2101 Constitution Ave., N. W., Washington, D. C. (10 cents a copy for orders of 10 or more). The quality and sanitary characteristics of our foods have been improving, and there is no evidence that disease epidemics or other health hazards have resulted from the use of chemicals in crop production or in food production.

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DENTISTRY

Learning How to Use False Teeth

➤ SOME OF the troubles people have when first fitted with a set of false teeth are matters the dentist must correct. But some of them are problems for the patient to solve.

It helps if patient and dentist talk the matter over beforehand, so that the patient knows what to expect and what not to expect in the way of service from his new teeth. One thing he will learn, incidentally, is that dentists call these replacements dentures.

"There are certain tricks to wearing dentures and these should not be left to the patient's ingenuity to discover," states Navy Capt. Frank M. Kyes of the Naval Dental School at Bethesda, Md., in a report to the JOURNAL OF THE AMERICAN DENTAL ASSOCIATION. Among the tricks for patients to learn he gives the following:

1. Push inward and upward when biting such foods as apples and carrots.
2. Tighten the corners of the mouth against the lower flange when the mouth is opened wide.
3. Try to chew with an up and down motion, using a minimum of side movement.
4. Keep the tongue low and well forward in the mouth to stabilize the lower denture.
5. Close, suck and swallow frequently when first wearing dentures because such action seats the dentures firmly.

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INVENTION

Improved Equipment Aids Airplane Fueling in Flight

➤ IMPROVED EQUIPMENT for refueling an airplane in the air from a flying tanker plane has been issued a patent by the government. The ability to make an easy and quick connection of the receiving plane with the trailing tube through which fuel passes from the tanker is claimed as its feature.

The flexible connecting hose that is played out to trail below the tanker plane and be picked up by the craft to be refueled carries on its end what is called a "bird." This is a mechanical device with airfoil means for stabilizing it both longitudinally and directionally. This makes it a relatively stationary target for the boom on the receiving plane and easily picked up when the planes are traveling at the same speed in the same direction. Electromagnetism in bird and boom assists automatic coupling.

Inventor is Frederick I. Steele, Columbus, Ohio. Patent 2,582,609 was his award. Rights have been assigned to Curtiss-Wright Corporation whose airplane division is also in Columbus.

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ZOOLOGY

Only Four Koalas Outside Australia Arrive in U. S.

See Front Cover

➤ ONE OF the four Koalas that arrived this month in Los Angeles on their way to the San Diego Zoo is shown on the cover of this week's SCIENCE NEWS LETTER accepting San-Diego-grown Eucalyptus readily. The four are the only Koalas anywhere in the world outside of Australia and were sent to the United States for use in a motion picture. After their brief fling at stardom, they will be exhibited in San Diego's Zoo on an indefinite loan from the Australian government.

Southern California is one of the few spots on the globe outside of Australia which is suited to the survival of Koalas, since these living "teddy bears" feed only on the buds and leaves of certain species of Eucalyptus, a genus of trees native to the Australasian region and widely planted in California. Of the hundreds of species of Eucalyptus, only a dozen or so are eaten by Koalas.

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MEDICINE

Chloromycetin for Anthrax

➤ THE PAINFUL skin sores of sometimes deadly anthrax can be healed and the accompanying sickness remedied by chloramphenicol, or chloromycetin as this member of the Big Five antibiotic team is also called.

News of successful use of this remedy in four cases of skin anthrax among Indian laborers comes to physicians in a report from Dr. P. S. Clarke, chief medical officer of the Tingri Medical Association, to the JOURNAL OF THE BRITISH MEDICAL ASSOCIATION (Jan. 12).

Ability of chloramphenicol to stop anthrax germs in the test tube had previously been reported by other scientists. When five patients were brought to the hospital with this disease on the same day, Dr. Clarke had an opportunity to see whether the antibiotic drug would live up to its laboratory test promise.

One of the five died of the disease seven hours after reaching the hospital, in spite of treatment with penicillin. This man and the next three patients, two of them children, had eaten of a cow that had "died under suspicious circumstances" a week before. The fifth patient was the 10-month old baby of the second patient. The baby was being breast fed and had not eaten or handled the cow. But the father said that after he had cut off his portion from the cow and taken it home, he had taken the baby on his knee and played with it.

The father of this patient was treated on traditional lines, with penicillin, sulfadiazine and arsenical medicine, as a control for comparison with the chloramphenicol treatment.

A month later another man, of a different district and a different caste, came to the hospital with an anthrax sore on his back. "Dramatic improvement" followed 12 hours after chloramphenicol was started and this patient also recovered.

The chloramphenicol was supplied by Parke, Davis and Co., Detroit, U.S.A., who manufacture it and who also obtained permission from the Government of India to use it in these cases.

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TEXTILES

Fire Risk for Clothes

➤ HOW FAST your sweater or other clothes will burn depends not only on what they are made of but also on how the material has been treated.

A brushed rayon sweater may go up in flames almost instantaneously, but a brushed all-wool sweater will not burn because protein materials are usually not flammable. However, a brushed all-wool sweater may have the fibers brushed out from the material to such a length that a flame brought near them causes flash burning of only the very tips. This is much the same sort of singeing that can happen to body hair—the ends burn, often without any damage to the skin underneath.

To find out how flammable any material is, scientists make rate-of-burning tests. In the method approved by the American Association of Textile Chemists and Colorists, strips of material about five and one-half inches long and one inch wide are cut. These are fastened to an inclined plane, slanted at a 45-degree angle, then lit under carefully standardized conditions. Even the manner in which the flame is applied to the fabric is specified to insure that all results are comparable.

In such a test a five-inch strip of brushed rayon will burn in one to two seconds. Materials that are generally regarded as safe for use will usually take about six seconds to burn completely.

Standards to guide manufacturers and retailers so that they can tell whether a certain fabric now being made or being considered for manufacture is flammable or not are now being agreed upon. The standards have been in preparation for nearly a year, but the recent appearance of "torch" sweaters caused a speed-up.

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In an area in northern India where mosquitoes and malaria were brought under control in two years by spraying with DDT *land* values have about doubled.

• New Machines and Gadgets •

For addresses where you can get more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N ST., Washington 6, D. C. and ask for Gadget Bulletin 606. To receive this Gadget Bulletin without special request each week, remit $1.50 for one year's subscription.

⚙ *PLAY CRIB for the youngster on an automobile trip, a plastic affair that fits the rear seat, is padded on bottom and sides so that a child can not be hurt by bumpy roads, sharp turns or sudden stops. It is easily cleaned, and it can be folded into a compact package.*

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⚙ *GLASS-ALUMINUM wall covering is a sound-absorbing material which minimizes the noisy echoes in rooms where quietness is essential. It is made of aluminum foil between two layers of fibrous glass and is not only sound-absorbing but non-combustible and vermin proof.*

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⚙ *CLEANING MITTEN for the housewife is an oversized terry cloth glove that has a built-in pouch to hold soap or a cleaning compound. To use, it is merely wetted. It is for cleaning hard-to-get-at places but can also be used on the body while in the bathtub.*

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⚙ *DOG TRAINER, a recently patented device to train a raccoon-hunting dog to let rabbits alone, involves the use of an electric current sent through the carcass of a dead rabbit which gives the dog an electric shock. The current used is sufficient to give a disturbing but harmless shock.*

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⚙ *PLASTIC TABLE cover, an improved type with a textured fabric feel, features highly-stylized palm leaves against a basket-weave background, as shown in the photograph. Available in bright kitchen colors*

and subdued dinette tones, its lamination feature permanently seals in the colors because of a clear film which has been fused to the original print.

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⚙ *CIRCLE CUTTING attachment for bandsaws provides a rapid and accurate means of cutting out wooden disks without making a layout. An auxiliary table, placed on top of the regular bandsaw table, has a movable radius gauge pin on its upper surface which is used as a pivot on which the wood being cut is revolved.*

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⚙ *FLY SWATTER, recently patented, is a sort of slingshot device that shoots a square of swatter surface on the end of a dart against the insect on the wall. An elastic band, looped over thumb and forefinger, is used to project dart and swatter. The same elastic pulls the projectile back for another shot.*

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⚙ *AIR SCOOP, a one-piece casting for insertion in a horizontal pipe in a hot water heating system, removes the air liberated from heated water making the heating system more efficient. As air and water enter the device they encounter baffles which cause the air to rise into an upper chamber.*

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Do You Know?

Wood is the raw material for many chemically synthetic products.

Natural *gas* is not as poisonous as manufactured gases used for heating, which generally contain carbon monoxide, but it presents the same hazard of fire and explosions.

America uses about 65% of the *tin* produced in the world.

Hard deposits in *teakettles* are usually salts of calcium or magnesium; they can be removed by a mild acid.

Each kind of *bird*, for some reason yet unknown, tends to build a nest different from every other kind.